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# **BLOCKADES AND CYBERBLOCKS: IN SEARCH OF DOCTRINAL PURITY**

## **Will Maritime Interdiction Work in Information Age Warfare?**

A Monograph  
By  
Commander Karl A. Rader  
United States Navy



School of Advanced Military Studies  
United States Army Command and General Staff College  
Fort Leavenworth, Kansas

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Commander Karl A. Rader

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Approved by:

James J. Schneider  
James J. Schneider, Ph.D.

Monograph Director

Gregory Fontenot  
COL Gregory Fontenot, MA, MMAS

Director, School of  
Advanced Military  
Studies

Philip J. Brookes  
Philip J. Brookes, Ph.D.

Director, Graduate  
Degree Program

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## Abstract

This paper examines the blockade, as both a current concept and a tool suitable to Information Age Warfare. It addresses doctrine's twin demands for precise terminology, to aid shared understanding, and intellectual flexibility, required to win future conflicts.

Using joint doctrine, international law, and contemporary practice, the paper examines mixing the military and economic elements of power. Bloodless military coercion, as embodied by maritime interdiction--blockades, embargoes, and quarantines-- cannot achieve political ends on its own. It requires the exercise of all elements of national power in order to be effective. The paper applies this finding to Information Age warfare, and proposes the doctrinal concept of "cyberblock"-- the blockade of information transmission media as a Third Wave flexible deterrent option. Like the blockade, the cyberblock cannot necessarily achieve political ends alone. It is a strategic option, utile in the multilateral strategic environment, that relies on all elements of power to coerce international miscreants into compliance with United Nations' behavioral norms.

The paper shows that current joint doctrine requires more precise terminology. It further suggests incorporating the term "cyberblock" as a doctrinal concept that represents an Information Age approach to bloodless military coercion.

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## CHAPTER I: INTRODUCTION

*"The great advance toward better understanding and cooperation between the nations of the world in the establishment of the United Nations has, unfortunately, entailed the inevitable drawback that by being forced to presuppose a harmony which does not as yet exist it has fostered a habit of political make-believe, in which the great tensions which are the dominating factors of our age have not indeed disappeared but are only occasionally admitted."*

Herbert Rosinski, 1947<sup>1</sup>

### **Plus ça change, plus c'est la même chose <sup>1</sup>**

As the post-cold war world develops its new power distribution, the call to discard Cold War paradigms in favor of new, "information age" models, is a popular subject in both military journals and the popular press. This is not the first time the end of a war prompted the proclamation of a new age. World War I was hailed as the "War to end all wars," and a "New world order" was predicted at the end of 45 years of United States-Soviet Union antagonism. Many Cold War based military assumptions are being examined to ensure their relevance to current and future strategic environments.

The motivation for reform is at once ideological and practical-- unloading the economic burden of the Cold War is one way to allocate resources toward less bellicose problems facing America, and the world in general. Actions aimed at maintaining a stable environment for international trade, and promoting global security, must fit within the rubric of resorting to force only after less violent means of conflict resolution prove ineffective. The United Nations(U.N.) is

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<sup>1</sup>"The more things change, the more things remain the same."

charged with orchestrating global security.

Founded in the wake of World War II, the U.N. operates under the guiding principle of resolving international disputes without resort to armed measures. Even so, Article 42 of the U.N. Charter, Chapter VII, reserves to the U.N. the right to "... take such action by air, sea, or land forces as may be necessary to maintain or restore international peace and security. Such actions may include demonstrations, blockade, and other operations by air, sea, or land forces of Members of the U.N."<sup>2</sup>

The military options specifically reserved to the U.N. by Article 42 are demonstrations and blockade. A demonstration, frequently a show of force, may or may not be construed as a hostile act. A blockade, by international law, is an act of aggression--aggression being the particular international behavior the U.N. was founded to curb. While the ideal of influence through non-coercive means is paramount, maritime force is not ruled out as a sanction against international misbehavior.

The blockade was once the domain of admirals. Since the end of World War I, it has become intertwined with the political measures by which states exert influence to achieve political ends. Blockades target an opponent's sea communications. Potential miscreants in the post-Cold War era include nation states, states, and non-national entities.<sup>3</sup> The susceptibility of international actors to U.N. sanctions appears to be changing as the Information Age evolves. The blockade, an element of maritime strategy that evolved into a political gambit, needs redefinition to retain its utility as a coercive tool.



## **Fitting Military Means to Political Ends**

Before planners create multidimensional campaigns to bloodlessly coerce an enemy, they must first understand the nature of the tools at their disposal. This paper examines the following question: "Is the current definition and understanding of blockades, and lesser forms of maritime interdiction, sufficient to give joint planners a useful tool for the design and conduct of campaigns and major operations in information age warfare?" The paper will first explore doctrinal definitions to clarify what operations meet the demands of war, and operations other than war. It explores the setting in which blockades and other forms of commerce interdiction are employed. Contemporary examples are compared to known measures of effectiveness to illustrate how leverage can be applied to achieve military, and bloodless, coercion. These fundamentals are extrapolated into the context of "information age warfare," identifying factors which can be "blockaded," or otherwise interdicted, to create effects similar to those of effective blockades. Finally, doctrinal definitions for the various forms of maritime interdiction are proposed to ensure doctrine aids, rather than hinders, practical application of bloodless military coercion.

## **Coercion as Policy**

The methods political entities use to influence each other range from diplomatic intercourse to full scale military conflict.<sup>4</sup> Coercive measures are often undertaken when negotiations fail to achieve political goals. Coercion comes in one of three forms: military coercion, "bloodless" coercion, and bloodless military

coercion.<sup>5</sup> The U.N. was founded in 1945 with the purpose of reducing the scope and frequency of war as a method of interstate conflict resolution.<sup>6</sup> While general global war has been avoided, military coercion remains a popular policy option. In the 50 years since the U.N.' founding, over 7 million soldiers and 40 million noncombatants have died as result of some 160 *international* and *intranational* armed conflicts.<sup>7</sup> Recent U.N. sponsored operations in Kuwait, Bosnia, Somalia, and Haiti indicate that military coercion remains a constant in international relations. It is not, however, the only effective method of influence.

Nations, states, and other political entities exercise influence within the constraints of their power and resources. A current paradigm defines the elements of national power as diplomatic, economic, military, and information. Military coercion is the act of employing the military element of power, armed force, to impose a condition upon another political entity. It may or may not include the formal declaration of war. While other elements of power may be employed in conjunction with military power, its effects tend to outweigh other elements of power during armed conflict. Bloodless coercion seeks to achieve political ends through exercise of one or more elements of power without resort to armed force.

The concept of bloodless coercion as policy is as old as Sun Tzu: "To subdue the enemy without fighting is the acme of skill."<sup>8</sup> Bloodless coercive techniques include propaganda campaigns, political blackmail, diplomatic brinkmanship, and economic warfare. Of these, the first three attempt to use information as leverage to modify an opponent's behavior. Economic warfare is

aimed at creating physical effects throughout a society without resort to military force. Boycotts, embargoes, currency manipulation, and tariff policies can generate physical effects on national economies, altering quality of life and economic health. The Arab oil embargo against the United States in the 1970's is an example of economic warfare's ripple effect.

Petroleum scarcity caused the first order effects of increased energy prices, greater dependence on Iran as an oil supplier, and a resurgence of oil exploration within the United States. Second order effects included paradigm changes for major car manufacturers, the increased cost of producing goods and services, and the imposition of a national 55 mile per hour speed limit in the name of energy conservation. Third order effects included the penetration of Japanese automobile imports into the American automobile market, plant closings in Detroit, and government mandated gas mileage performance standards. Economic, bloodless coercion influenced every American's quality of life.

Bloodless military coercion is a political hermaphrodite. The military element of national power is presented as a threat, though success is defined by achieving political objectives without actually resorting to force. Policy makers pursue either a psychological or physical effect that will convince their opponent to either cease a particular course of action, or maintain a current position when an undesirable change in policy is imminent.<sup>9</sup> Naval forces frequently act as tools of bloodless military coercion.<sup>10</sup> A popular combination of the economic and military elements of power is commerce interdiction, often referred to, imprecisely, as a blockade.

## **Blockades: Do They Have a Future?**

The blockade's lesser forms of sea denial and commerce interdiction, quarantine and embargo, are popular flexible deterrent and coercive options. The true blockade is a slow acting sanction, in both war and Operations Other Than War(OOTW). In the interest of causing the least harm to neutrals, international custom and law place concise requirements on the use of blockades during declared war.<sup>11</sup> True to the spirit of the U.N., formal declarations of war are now the exception rather than the rule.<sup>12</sup> The trend toward undeclared wars mitigates against true blockades occurring with the frequency of previous eras.

Corbett and Mahan praise the close and distant blockades, perfected by the Royal Navy during the Age of Sail, as effective economies of force in the context of maritime strategy.<sup>13</sup> In the first half of the 20th century, blockades were employed as elements of total war, aimed at shutting down industrial economies dependent on external sources for strategic materials. In the Cold War, the U.S. Navy faced the real threat of a classic defensive blockade by Soviet nuclear attack submarines. The Soviet submarines were capable of employing mines and torpedoes to keep significant portions of the Atlantic and Pacific fleets bottled up in their home ports in the event of war. However, blockades have undergone a metamorphosis.

The quarantine President Kennedy imposed on Cuba during the 1962 Cuban Missile Crisis was so labeled to avoid committing an act of war. The mine blockade of Haiphong Harbor was of short duration and limited in strategic aim.

The recent UN sponsored embargo of Haiti, a sanction meant to force General Cedras' government from power, was implemented under the assumption that his government cared about the population's welfare. Unlike blockades in a general war, modern commerce interdiction requires multilateral action.

Modern "blockades" are not a cheap deterrent option. They require expenditure of political capital and energy, both domestically and internationally. The global economy's interdependence robs purely naval blockades of their former power: a blockader may hurt himself and his allies as much as his target. As useable coercive tools, "blockades" require a target vulnerable to commerce interdiction and sea denial. Extrapolating the concept of "jointness" beyond the military realm, other elements of national power should be integrated into the modern blockade to achieve synergistic effects by combining diplomatic, economic, military, and informational actions.

Alvin and Heidi Toffler's War and Anti-War, a recent work on the future of war, proposes a brave new world of bloodless war made possible through the application of exotic new technology. The Toffler's discard traditional concepts of bloodless coercion, on the premise that they are bound by industrial age limitations.

"Geo-economic war is not a substitute for military conflict. It is, all too often, merely a prelude, if anything a provocation, to actual war, as it was in the U.S.-Japanese rivalry leading up to the Japanese attack on Pearl Harbor in 1941.<sup>14</sup>

If the Toffler's are right, and the Third Wave requires new tools to win wars in the information age, then economic blockades, information blockades,

monetary blockades, space and electro-magnetic spectrum blockades, and military blockades become options available to strategic and operational planners. One possible marriage of military and other elements of power to disrupt a target nation's economy could look like this: B-2s equipped with electronic jamming pods, in conjunction with carrier based EA-6Bs, jam cellular phone nets and microwave communication towers within a target nation. Satellite transmitted computer viruses invade the phone system, disabling fiber optic switching nodes. Simultaneously, the American government and its allies enact asset freezes and moratoria on electronic fund transfers against the target, in concert with enforcing a trade embargo on selected commodities. The effect should cripple the economic freedom of action of the target's citizens, wealthy and poor, creating real, not vicarious, pain for decision makers. First and Second Wave economies, less vulnerable to these methods, might only be vulnerable to more traditional commerce interdiction and sea denial. Third wave blockades will doubtless spawn information age blockade runners.

The first step in translating current blockade theory into a useable information age concept lies in understanding maritime interdiction in general, and blockades in particular.

## **CHAPTER II: MARITIME INTERDICTION AND BLOCKADES**

*Blockade: The isolating of a place, especially a port, harbor, or part of a coast by ships or troops and aircraft to prevent entrance or exit.*

Joint Pub 3-04<sup>15</sup>

## What is a Blockade?

The Armed Forces Staff Officer's Guide (AFSC Pub-1) lists "blockade" among its flexible deterrent options.<sup>16</sup> To employ a deterrent effectively, one should understand the concept behind it. Precise terminology aids understanding. Unfortunately, since World War I, the use, misuse and mutation of the term "blockade" confused rather than clarified the concept. Working from theory to current usage, one can clear up the relationship between blockades and lesser forms of maritime interdiction.

Naval theorist Sir Julian Corbett defines the blockade within the context of maritime strategy. It is an integral part of establishing local command of the sea,

"Putting out our enemy's power to use effectually the common [sea] communications or materially to interfere with our use of them."<sup>17</sup>

Corbett describes two kinds of blockades:

Close Blockade: An operation designed to prevent an enemy from putting to sea. (defensive intention)

Observation blockade: An operation designed to force the enemy to put to sea by occupying the common lines of communications. (offensive intention).<sup>18</sup>

American theorist Alfred Thayer Mahan explored the blockade's dual nature, asserting that while there were two types of blockade, they performed both offensive and defensive functions simultaneously. "Blockades," he suggests, "are of a twofold character: offensive and defensive." The difference lies in emphasis, as determined by mission and situation. The offensive blockade's primary purpose is "to prevent the entrance of needed supplies, and

being therefore a blow against communications.” The defensive blockade orients on the enemy fleet: “Its chief objective is to prevent egress unmolested, because such freedom of issue to an enemy means danger [to the blockading fleet].”<sup>19</sup>

Both Mahan and Corbett’s primary points of reference were the operations of the Royal Navy in the age of sail, though the actions of the Atlantic Blockading Squadron in the Civil War were recent enough to influence their theories. British use of blockades as a form of commerce interdiction date back to 1650, when Robert Blake intercepted and captured a Portuguese fleet enroute from Brazil. In doing so, “he established the right of maritime nations at war to interdict the neutral trade which might be used to aid the enemy.”<sup>20</sup> In 1756, the rules of war “extended blockade to blue water interdiction.”<sup>21</sup> By the end of the Napoleonic wars, the Royal Navy enforced England’s version of the law of the high seas.<sup>22</sup>

The enforcing authority behind the law of the seas is, by custom and practice, “might makes right.”<sup>23</sup> England and America, the most powerful maritime nations of the past 200 years, derive wealth and power from international trade. It is under the umbrella of their sea power that they, and other nations, continue to accrue the economic benefits of that trade. It follows that the laws of the sea would evolve to conform with their visions of law. In the case of the laws pertaining to blockades, they do.

Among the reasons given by President Wilson for declaring war on Imperial Germany in 1917 was German U-boat attacks against “neutral (American) shipping.” Freedom of the high seas was the second of Wilson’s Fourteen Points.<sup>24</sup> While neutral rights were virtually abandoned in 1941 for the



duration of the Second World War, they returned with the birth of the U.N.<sup>25</sup> The premise that neutral nations should be allowed to continue maritime commerce while other nations fought each other was obviously put forth by people who benefit from seaborne trade. The law of neutrality "serves to localize war, to limit the conduct of war on both land and sea, and *to lessen the impact of war on international commerce*."<sup>26</sup> The provisions of neutrality also influence regulations concerning blockades.

The best doctrinal definition of "blockade" is found in Naval Warfare Publication(NWP)-9(Rev A.), The Commanders' Handbook on the Law of Naval Operations, in the chapter devoted to Laws of Neutrality.

"Blockade is a belligerent operation to prevent vessels and/or aircraft of all nations, enemy as well as neutral, from entering or exiting specified ports, airfields, or coastal areas belonging to, occupied by, or under control of an enemy nation."<sup>27</sup>

Use of the term belligerent connotes a "legal relationship between nations engaged in armed conflict."<sup>28</sup> While NWP-9 does not consider the declaration of war as germane to belligerent status, contemporary political practice is to avoid blockades, with the express intent of not committing an act of war or aggression.

Blockades must conform with the following guidelines:

1. They must be openly declared by the nation or political entity, such as the U.N., conducting the blockade. Specificity as to time, location, and the grace period for neutral ships and aircraft to leave are required.
2. Effective notification to all affected parties is required to minimize unintentional breach by a neutral.
3. The blockade must be effective to be valid. In other words, one cannot

- legally declare a blockade if one has insufficient sea power to back it up.
4. A blockade must be impartial. Every neutral must be forced to comply with the blockade's provision.
  5. The blockade may not interdict areas neutral to the conflict in question. Normal commerce external to the blockaded nations territory and waters may not be legally interfered with.<sup>29</sup>

Under international law, the belligerents retain rights as part of the normal conduct of war.

"The belligerent right of blockade is intended to prevent vessels and aircraft from crossing an established and publicized cordon separating the enemy from international water and/or airspace."<sup>30</sup>

To illustrate where joint doctrine confuses the issue, compare the definition provided to the Joint Staff Officer(JSO), an operational planner, in AFSC Pub -1:

"There are different degrees of blockade. The objective of an absolute blockade is to cut off all enemy communication and commerce. It attempts to isolate a place or region and it can apply to all means of transportation. The international community considers an absolute blockade an act of war. The pacific blockade is a lesser degree of blockade. This type may not be perceived as an act of war. It is often limited only to carriers that fly the flag of the adversary state. A blockade may be a forceful method of bringing pressure to the opposition without risk to a large military force."<sup>31</sup>

NWP-9 makes no reference to "pacific blockade." Neither does legal scholar D.P. O'Connel, in his work The Influence of Law on Sea Power. The Code of International Conflict recognizes no modification of blockade: it is an act of aggression in accordance with article 221.2.c. According to U.S. Naval doctrine, customary practice, and international law, you are either conducting a blockade or you are not. The Joint definitions of blockades lack clarity.

Joint doctrine mandates that the operational level of war is necessarily joint. To be successful, blockades must be joint. The current errors in joint doctrine could lead operational level planners to suggest a declaration of the non-existent "pacific blockade," thus recommending to decision makers an act of war as a flexible deterrent option. This contradicts the intent of deterrence.

A deterrent option is a "course of action designed to dissuade an adversary from undertaking current or contemplated operations."<sup>32</sup> It is a course of action designed to deter, i.e. signal or threaten military action, not actually undertake it. Instituting blockade, a "belligerent action" or "act of aggression," exceeds deterrence and prematurely crosses over into war. Fortunately, there are other options--but they are not properly termed "blockade."

#### **Quarantine: Is Aggression a Curable Disease?**

When President Kennedy chose a suasive response to the presence of Soviet nuclear ballistic missiles in Cuba in 1962, he wanted to constrain (coerce) Soviet behavior without resorting to armed conflict. While the quarantine he imposed on Cuba looked like a blockade, it was deliberately designed not to provoke war. Appealing to legality, it invoked the right of collective self defense guaranteed in Article 51 of the U.N. Charter. Its purpose was to prevent the introduction of particular dangerous items into Cuban soil, thereby insuring the collective security of the Western Hemisphere. There was no intention to interdict generally Cuban or Soviet commerce.<sup>33</sup> The idea behind the use of the term "quarantine" bears discussion.

Franklin Roosevelt appears to have been the first to apply the commercial and medical term quarantine to the realm of international relations. Regarding Japan's continued aggression against China in 1937, he proposed a "quarantine of aggressors."<sup>34</sup> This is a particularly apt concept. Considering aggression as a disease, a construct in the spirit of Article X of the Covenant of the League of Nations, Roosevelt sought to evoke the image of isolating a sick, aggressor nation from the rest of the healthy, peace loving nations of the world.<sup>35</sup> His idea remains valid today, within the context of the U.N. treating aggression as antisocial behavior.

The dictionary defines quarantine, *noun*, as:

4. Any isolation or restriction on travel or passage imposed to keep contagious diseases, insect pests,[nuclear arms?] from spreading."<sup>36</sup>

Quarantine, *verb*, is defined as:

1. To put under quarantine; to cause to undergo quarantine(cf above) 2. To isolate politically, commercially, etc.; as an aggressor nation."<sup>37</sup>

Unfortunately for military planners, the 1962 quarantine engendered a deterioration in the clear terminology defining the use or threat of military force to deny an adversary use of seaborne communications. Absent a declaration of military war, disrupting someone's sea line of communication takes on the character of economic war: bloodless coercion. Two such forms are embargoes and boycotts.

### **Embargoes: The New, All Purpose, U.N. Sanction**

When the U.N. and OAS imposed sanctions against the military junta which deposed President Jean Bertrand Aristide in Haiti, care was taken to label it an embargo, though many observers characterized it as a blockade. The arms embargo currently in force against the former Yugoslavia, Operation Maritime Guard, is deliberately not referred to as a blockade--though again, some journalists and other pundits classify it as such.<sup>38</sup> The imposition of economic sanctions against Iraq in August of 1990 took on the character of a trade embargo, particularly regarding Iraqi oil. The operation was called an embargo, and the American forces officially conducted "Maritime Interception Operations."<sup>39</sup> Once hostilities started January 16, 1991, it could legitimately be characterized as a blockade: belligerency was now moot. The U.N. prefers economic warfare as a sanction, backed up with military force when necessary, in an attempt to forestall bloodshed. An embargo fits a variety of situations.

Embargo is defined as:

Any restriction imposed on commerce by law; especially, a prohibition of trade in a particular commodity. *civil embargo*: an embargo laid on ships of citizens by their own government; *hostile embargo* an embargo laid on the ships of an enemy.<sup>40</sup>

Embargoes are newcomers to American military doctrine. They are not defined in any current doctrinal publication.<sup>41</sup> The Naval Doctrine Command's next release, NDP-3, Operations, has a section devoted to embargoes under the general heading of Operations Other than War.<sup>42</sup> In time, it may supersede the term quarantine, which threatens to fall from usage, unless specifically applied to weapons of mass destruction. Embargo better embraces the intent behind

peaceful maritime interdiction. It is a flexible constraint on trade, and does not constitute an act of military coercion, or war.

### **Maritime Interdiction**

The common thread in blockades and embargoes is their maritime nature. They both attempt to restrain or interdict an adversary's sea communications in wartime or peacetime. As a generic concept, they are both facets of the fundamental concept of maritime interdiction, which Corbett calls sea denial. The desired effect is infliction of economic pain on the target's economy overall, with emphasis on the contraband of war and the means to wage war. This implies that blockades and embargoes are tools employed at the strategic level of war. But what of the close blockade made famous by the Royal Navy in the age of sail? Are defensive blockades that restrict an enemy to his port still valid tools?

The advent of aircraft, submarines, torpedoes and increasingly effective mines made the close blockade a greater danger to the blockading fleet than to the blockaded fleet. As early as World War I, the Royal Navy forsook the close blockade in favor of the distant blockade. Corbett saw the close blockade as an economy of force. It allowed the bulk of one's fleet to exercise sea control, while keeping the enemy in his harbor. The capacity to strike a fleet in a harbor with aircraft (Taranto) or daring submarine raids (Scapa Flow 1939, Gunther Prien in U-47), or to bottle it up with mines (Haiphong Harbor), rendered close blockade a violation of economy of force. The death knell to the close blockade was struck by the Egyptian Navy, when it sank the Israeli destroyer *Eilat*, using four Styx

missiles fired from a patrol boat tied to a pier at Port Said in 1967.<sup>43</sup>

Distant blockades, the attempts to lure enemy fleets out to fight on the blockader's terms, were a necessary expedient when one could not assail a fleet protected in its harbor. Beginning with World War I, they were subsumed by war at sea and unrestricted submarine warfare-- as practiced by the Royal Navy and German Navy respectively in two World Wars, and by the United States against the Japanese in World War II. Blockades changed with the introduction of aircraft and submarines into fleet inventories.

Current Joint doctrine covers the operational level concept of blockade with the term "sea control operations:"

The employment of naval forces supported by land forces and air forces as appropriate, to achieve military objectives in vital sea areas. Such operations include destruction of enemy naval forces, suppression of enemy sea commerce, protection of vital sea lanes, and establishment of local military superiority in areas of naval operation."<sup>44</sup>

This definition connotes an implied task of maritime interdiction within the sea control mission . Maritime interdiction is discussed in Joint Pub 3-0, Doctrine for Joint Operations as an early action of the Desert Storm campaign.<sup>45</sup> Unlike air interdiction, maritime interdiction is not independently defined under current joint doctrine.<sup>46</sup> Generically, interdiction is :

"an act to divert, disrupt, delay or destroy the enemy's surface military potential before it can be used effectively against friendly forces."<sup>47</sup>

By extension, maritime interdiction disrupts, destroys, delays, or diverts enemy shipping and/or naval forces, depending on the nature of interdiction

chosen. If purely economic pressure is desired, maritime interdiction is fulfilled by an embargo. If sea control operations are called for in a belligerent context, then maritime interdiction takes the form of a true blockade. Before examining what makes effective maritime interdiction, its salient features are summarized.

1. It is a strategic, not an operational level tool.
2. Under international law, it must be impartial, advertised, limited to a geographical region, and minimize interference with neutral commerce.
3. Once armed hostilities commence, sea control will consume any blockade, embargo, or quarantine under the rubric of sea control operations. However, the conduct of blockade must comply with international law.
4. It is directed at an adversary's economy and trade, and as such combines bloodless and military coercion.

Maritime interdiction is a tool useable in both war and Operations Other Than War(OOTW). Examples of recent maritime interdiction illustrate some of the strengths and shortcomings of bloodless and armed coercion. Second Wave, industrial age experience provide base measures of effectiveness which can be adapted to Information Age warfare.



### CHAPTER III: MARITIME INTERDICTION AT WORK

*"Success is not measured by adverse economic impact on Iraq; success is withdrawal from Kuwait."*

Dept of State Dispatch, Jan 14, 1991

#### **Economic Coercion: The Common Denominator**

Tying military coercion to economic warfare, or bloodless coercion, is a difficult synthesis. Part of the problem lies in linking ends to means. Before discussing "bloodless military coercion," it is useful to examine purely economic measures as coercive policy. Boycotts and embargoes, particularly civil embargoes, are common tools of economic warfare.

A boycott is defined as "a concerted refusal to have dealings with (as a person or a business.)"<sup>48</sup> It takes on the character of a *civil embargo* when the government prohibits domestic trading concerns from dealing with boycotted nations or corporations. A modern example is the multilateral Arab boycott of Israel.

The Arab boycott of Israel began when the Council of the Arab League declared that "...Effective January 1, 1946, Jewish products and manufactured goods shall be considered undesirable in the Arab countries."<sup>49</sup> This was part of a three-pronged strategy undertaken by the Arab League, employing military, diplomatic, and economic elements of power. While the military element of power was exercised sporadically in 1948, 1956, 1967 and 1973, the policy of boycott maintained coherence. The boycott's ultimate objective was to cripple Israel's economy by eliminating trade with its adjacent neighbors, as well as with third

party countries.<sup>50</sup>

The Arab League attempted to enforce secondary and tertiary boycotts. They officially refused to do business with companies that did business with Israel. They also attempted to prohibit transactions and contracts with companies who did business with companies that did business with Israel! They even tried to prohibit any airline flying to Arab airports from providing passenger service to Israel. This last measure backfired when the International Civil Aeronautics Organization(ICAO), the international body governing civil aviation, responded by threatening to cancel all flights to Arab countries.<sup>51</sup>

Until the Yom Kippur war of 1973, the boycott achieved a measure of success, though it did not precipitate a collapse of the Israeli economy. Coca-Cola opted against building a proposed plant in Israel in 1966, and Japan virtually ceased exporting to Israel.<sup>52</sup> The combination of oil shortages resulting from the Yom Kippur War and intense international lobbying by the Israeli Economic Warfare Authority gave birth to a series of anti-boycott measures.

In October 1975, economic boycotts and embargoes levelled against third parties were ruled illegal under international law by a panel of international jurists.<sup>53</sup> Amendments to the American Export Administration act of 1977 officially forbade American companies from complying with the Arab boycott of Israel, imposing fines on companies found in violation of the act. For example, Safeway Stores had to pay a \$995,000 fine in 1988 for illegally complying with the Arab boycott.<sup>54</sup> The boycott was further eroded by the 1979 Camp David agreements. Egypt became a trading partner with Israel, undermining previous pan-Arab

cohesion. By 1991, Japanese firms like Toyota, were exporting to Israel--a significant policy reversal in light of Japan's dependence on oil imports.

Another setback to the boycott was the surreptitious trade conducted by parties within the Arab nations themselves. Thus, according to one writer,

Despite the Arab boycott, Israeli businessmen do a thriving business--perhaps \$500 million worth of goods annually...[apart from a share of Israel's \$1 billion annual arms sales]. . . Israeli manufacturers, working with Arabs in Israeli administered territories and with sympathetic European and American traders abroad, have found ways to penetrate even the hostile countries in the Arab market, selling everything from irrigation systems to ouds(an Arabic guitar)...<sup>55</sup>

One obstacle to waging successful economic warfare is economic competition. Every actor in the international economy, be it nation state, ethnic group, drug cartel or financial consortium, looks after its own interests and financial health as a matter of survival. Without an absolute monopoly on a particular commodity, or overwhelming support from the international community, the vagaries of the market place can create new economic relationships which render economic coercion less effective. On the other hand, building an international consensus and tying diplomatic and information campaigns to economic sanctions can be successful.

An example of economic coercion which worked was the coerced reform of the South African apartheid policy. It took the combined effort of economic sanctions, persistent information campaigns, and diplomatic pressure to create change from within South Africa. The apartheid policy established in 1948 was not repealed until 1991, after continual, escalating international economic pressure

was applied. The final implementers of change were South Africans desiring to rejoin the international community.<sup>56</sup>

This example of successful informational and economic coercion shows that information age blockades can be as effective as traditional blockades and embargoes. The two generations it took to coerce South Africa "bloodlessly" into changing its behavior illustrate a measure of effectiveness common to embargoes, blockades and boycotts--patience.

A caveat regarding economic warfare is the creation of unintended consequences. The most glaring example is American embargo of Japan, beginning in 1940. Rather than coercing Japan into stopping its aggression on the Asian mainland, it forced Japan into a flight-or-fight situation--and they came out fighting. The surprise attack on Pearl Harbor was an unintended consequence of economic warfare.<sup>57</sup> It is a stark reminder that stepping into the realm of economic warfare, with or without military means, is a policy choice at the strategic, not operational, level.

### **How Maritime Interdiction Works**

Returning to military coercion, a brief discussion of how blockades work illustrates the baseline measures of effectiveness. Blockades deny sea communications to the enemy--both militarily and commercially. Embargoes interdict commercial shipping, presumably inflicting sufficient economic pain to convince the punished state to modify its offending behavior. Two cases, Vietnam and Haiti, illustrate some of the necessary elements of successful

maritime interdiction. They also illustrate that effective blockades and embargoes are necessarily joint operations, accentuating the current doctrinal void surrounding blockades and maritime interdiction.

### **Haiphong Harbor**

During the Vietnam War, President Johnson employed a strategy of graduated response, designed to coerce the Hanoi government into terminating their aggression against South Vietnam. His most flexible tool was the use of Air Force and Navy planes to bomb North Vietnam. He could apply military coercion in this medium, virtually at will, in the intensity and duration he desired. One option considered, but not implemented, was the blockade of Haiphong harbor. When it was proposed in 1965, and again in 1968, he deemed it inappropriate in light of the perceived international political climate.<sup>58</sup>

In 1972, President Nixon approved the blockade as a measure of coercion to drive North Vietnam to the peace tables. A blockade by mine was declared, and neutral shipping notified. The precedent for blockade by mining had been set in 1940, so the necessary conditions of a legal blockade were met: The declaration of blockade, equal treatment of all neutrals (mines are impartial), capacity to enforce the blockade, and limited geographic area.<sup>59</sup> As there was little debate over the belligerency between America and North Vietnam, many neutral ships promptly left the harbor.

"Of the 72 ships within Haiphong when the announcement was made that the mine field was being laid, over a quarter were under way to sea within three hours. No ship was lost."<sup>60</sup>

The mine field went in on the night of 8-9 May 1972. Some effects were immediately apparent.

The object of this mining effort was to stop/ reduce the flow of goods into North Vietnam. In a direct manner, the flow of goods into Hai Phong by large ships was stopped.<sup>61</sup>

The most profound effects were realized in concert with the Air Force and Navy air operations over North Vietnam.

In addition to the direct impact of mining, the flow of goods was indirectly reduced by mines. An example of this is in train damage. More trains were damaged during mining than before the mining effort. Before mining, the necessary flow of goods could be achieved by trains operating only at night and hiding during the day. The closure of Hai Phong placed a constriction in that flow and increased the requirement for the flow of goods by train. The trains, now having to operate in the day time, became better targets for aircraft.<sup>62</sup>

Trains were not the only target made more lucrative by this blockade. While American pilots were prohibited from bombing neutral merchant ships outside the mine fields, Vietnamese coastal lighterage craft were legal, vulnerable, air attack targets.

"The large resupply ships were off-loaded into Water-borne Logistic Craft(WBLC). The WBLCs were then used to move the supplies ashore. After the WBLC moved away from the moored supply ship, it became a target for air attack."<sup>63</sup>

Another synergistic effect of the blockade was felt during the Linebacker II operations in December of 1972. Over an intense 14 day bombing period, 26 B-52's were shot down over North Vietnam through the expenditure of over 1200 SAMs. Then the North Vietnamese ran out of SAMs.<sup>64</sup> The SA-2's could not be off loaded onto WBLC's--Soviet supply ships were successfully interdicted. Air

power enthusiasts assert that bombing brought Hanoi to the negotiating table. It may be more accurate to attribute it to the North's realization that it was defenseless against continued air attack. The combined effect of naval blockade and air attack convinced Hanoi that it was in their best interest to negotiate with the American government, who had been trying to get them to the peace table for some time.

### Haiti

When General Cedras took over power via *coup d'etat* in September 1991, the snub to U.N. sponsored elections in Haiti the year before created an international furor. The U.N. and OAS established an embargo, under U.N. Resolution 46/7, 1991, designed to coerce the junta into readmitting deposed President Aristide, the winner of the U.N. sponsored election.<sup>65</sup> Moves to freeze the U.S. assets of Haitian elites, a bloodless coercive measure, were so badly telegraphed that they failed to apply economic pain where it would do the most good.<sup>66</sup>

The embargo wrecked the already anemic Haitian economy. Various sources disagree on the magnitude of unemployment, but at least 25,000 jobs were lost in light industry by the end of 1993.<sup>67</sup> Tourism all but vanished, foreign companies scrapped development plans, and basic needs like fuel, food, and medical supplies were simply unavailable. In an economy with a GNP of about \$2 billion, where 30% of its annual income came from foreign aid, embargo spawned an economic disaster. The junta stayed in power, unwilling to knuckle

under. The objective of inflicting pain was achieved, but unfortunately, in the wrong places.<sup>68</sup>

The tangible threat of military invasion, represented by aircraft filled with soldiers of the 82d Airborne Division, when added to the embargo, diplomatic and information campaigns, coerced General Cedras and his cronies into a negotiated settlement. The embargo, successful in inflicting economic pain, failed to achieve the political end over a period of three and a half years. When the synergistic effects of credible military threat was added, the political objective was gained. The lack of credible leverage in Haiti mitigated against successful maritime interdiction without military involvement.

### **Unintended Outcomes and Credible Leverage**

In Vietnam, the United States got Hanoi to the negotiating table by adding the blockade to a joint campaign of military coercion. One unintended outcome of this was the need to sweep the mine fields once the war was over. American Naval Units were removing mines from Haiphong Harbor up through July of 1973-six months after the desired effect had been created.<sup>69</sup>

Another unintended outcome of bloodless coercion was the Haitian refugee flow into the United States during the U.N./OAS embargo. While some refugees were no doubt genuine political exiles, the destruction of their economy put Haitians in such straits that emigration, like nineteenth century Irish migrations during the potato famines, was one of the few survival options left. The American aim to stem the refugee flow by making Haiti a better place to live



played a part in the decision to remove General Cedras. Coercion via embargo failed due to the junta's indifference to their population's suffering.

The problem of credible leverage is a major weakness of bloodless military coercion. Policy makers frequently misjudge the capacity for embargoed nations to withstand the hardships brought on by commerce interdiction. They often underestimate the disconnect between repressive regimes and their populations, such as those led by Saddam Hussein and General Cedras.

Maritime interdiction is not a precision instrument. It is designed to inflict pain throughout an economy. In the case of Haiti, leaders were astute enough to protect their assets from the telegraphed freeze. In Iraq, even after four years of trade sanctions, there is evidence that Hussein

"has spent \$1.5 to \$2 billion. . . to build 48 residences or buildings for his ruling elite. . . while pleading poverty as a reason for allowing Iraq to resume oil sales, as France and Russia have urged."<sup>70</sup>

The sufferers become those with the lowest margin of economic safety--people who may not have the means to influence policy makers.

Additionally, new economic relationships, in the form of blockade runners or "entrepreneurs", create economic safety valves. These undermine the moral effect of isolation. Two current examples are the series of U.N sanctions in force against Iraq, and the arms embargo against former Yugoslavian republics. Together, they illustrate how multilateral cohesion is required for successful non-belligerent maritime interdiction.

### **The Downside to Economic Sanctions**

The U.N. Security council passed two resolutions within four days of Iraq's invasion of Kuwait. Resolution 660 generally condemned Iraqi aggression, and called for restoration of Kuwaiti sovereignty. Resolution 661, dated 6 August 1990, restricted all trade to and from Iraq,

... but not including supplies intended strictly for medical purposes, and in humanitarian circumstances, foodstuffs, to any person or body in Iraq or Kuwait."<sup>71</sup>

This sanction was not a declaration of blockade. It was a boycott, "complete or partial interruption of economic relations and of rail, sea, air, postal, telegraphic, radio, and other means of communication" as authorized under Article 41 of the U.N Charter. The Security Council did not exercise its article 42 prerogative to enact a blockade. On 25 August the Security Council created an armed embargo, calling upon

"member states...deploying maritime forces to the area... to halt all inward and outward maritime shipping in order to inspect and verify their cargoes to ensure strict implementation . . . laid down in Resolution 661."<sup>72</sup>

Security Council Resolution 677 set the deadline for Iraqi withdrawal and permitted "all necessary means" to ensure compliance with all previous resolutions related to getting Iraqis out of Kuwait.<sup>73</sup>

The outcome of the war is well documented, however the passage of time renders enforcement of UN sanctions more difficult. Iraqi compliance with all resolutions is a necessary prerequisite for removal of all sanctions. Full compliance has yet to be confirmed by the Security Council. In accordance with Article 25 of the UN Charter, member states should continue to "accept and carry

out the decisions of the Security Council." Some governments, notably France and Russia, are lobbying to end sanctions before full Iraqi compliance with U.N. resolutions. Their motive is restoration of normal trade relations with Iraq, which was interrupted in August of 1990.<sup>74</sup> Other governments either turn a blind eye to the illicit trade in Iraqi oil, or are unable to trace the path which brings Iraqi oil into the market place.

A network of international oil traders are buying Iraqi oil at a big discount-- \$8 to \$10 dollars per barrel, as opposed to the \$14 per barrel for similar grades of Middle East oil.<sup>75</sup> Kurdish rebels in the northern Iraq, many led by officers who once served in the Iraqi army, collect a tax for allowing fuel trucks to pass through their region. While no link to Turkish Kurds has been proven, "the Iranian government in Teheran has financial links to middlemen who operate along Iran's long border with Iraq."<sup>76</sup> At sea, small tankers have had some success evading the U.N. interception flotilla, transferring their cargo to other vessels in "the Persian Gulf area near Dubai."<sup>77</sup> Neither Iran nor Dubai are allies of Iraq. Both are U.N. members, yet they aid defiance of Security Council resolutions in deference to their own interests.

Operation Maritime Guard, the arms embargo against Croatian, Serbia, Bosnia and Montenegro, was established under U.N. Security Council Resolution 787. Its purpose was to "halt, inspect, and verify cargo and destination of all ships" entering the Adriatic Sea.<sup>78</sup> Through October of 1993, the NATO forces conducting the embargo "challenged over 5,000 ship, inspected or directed to port for inspection 400 ships and found several ships in violation of the UN

embargo."<sup>79</sup> The operation continues, but without unanimous support.

Recent information reveals that from October 1994, through March 1995, the United States endorsed the shipment of "hundreds of tons" of weapons and ammunition from Iran to the Bosnian government's army--most of whom are Muslim.<sup>80</sup> This deliberate violation of the U.N. arms embargo was apparently a conscious act of omission. A U.S. State Department spokesman was quoted as saying, "We're not really against someone helping the (Bosnian) Muslims."<sup>81</sup> While President Clinton's desire to end the embargo was no secret, he did not pursue lifting it out of deference to French and British security concerns for their peacekeepers in Bosnia. Ironically, the United States assisted an enemy, Iran, in defying the U.N. at the expense of America's allies.

The choice of the two examples is deliberate. The French pressure to relieve sanctions on Iraq, counter to American aims, is juxtaposed with American acquiescence to the violations of the arms embargo against Bosnia, at odds with French (and NATO) concerns. Britain supports continued enforcement of both sanctions, putting Britain at once in concurrence and at odds with both America and France, her allies in the war against Iraq in 1991. When belligerent measures-- establishing a true blockade-- are not included in maritime interdiction, and the hermaphrodite of bloodless military coercion in selected to influence behavior in accord with international security, the varying agendas of sovereign states can erode the coercive measure over time.

Given the obstacles to successful, non-belligerent maritime interdiction, generic measures of effectiveness should be useful in determining if the future

holds any promise its continued utility. A recent study of blockades', from the Peloponesian to Vietnam War, found three factors common to all successful blockades.<sup>82</sup>

- 1) Sea superiority/supremacy held by blockader.
- 2) Synergistic action by land and/or air forces.
- 4) Time and patience employed by the blockader.<sup>83</sup>

The study further found that since the founding of the U.N., international support and sanction were keys to successful maritime interdiction.<sup>84</sup> The recent experiences in Haiti and Iraq seem to confirm this finding. If old paradigms require reexamination to determine their relevance to information age warfare, comparing the effective Second Wave maritime interdiction to the information age environment should suggest whether or not maritime interdiction, the blockade and the embargo, can be incorporated into the evolving concept of warfare in the information age. Chapter IV addresses this issue.

## CHAPTER IV: BLOCKADES IN INFORMATION AGE WARFARE.

*"The first, the supreme, the most far-reaching act of judgement that the statesman and commander have to make is to establish. . . the kind of war on which they are embarking; neither mistaking it for, nor trying to turn it into, something that is alien to its nature."*

Carl von Clausewitz<sup>85</sup>

### What is Information Age Warfare?

In War and Anti-War, futurists Alvin and Heidi Toffler differentiate between First, Second, Third Wave civilizations by citing their primary productive archetype. Second Wave (industrial age) civilizations create wealth through mass production and exploitation of First Wave (agrarian age) civilizations and resources. The prime asset of Third Wave civilizations, denizens of the Information Age, is knowledge manipulation gained through high technology and information systems expertise. Their growth is characterized by domination and exploitation of both First and Second Wave civilizations. As agrarian and industrial societal forms produced unique styles of war, Information Age Warfare is evolving as Third Wave societies emerge.<sup>86</sup>

Warfare in the information age, Third Wave warfare, should not be confused with information warfare. For the purposes of this discussion, *information warfare* refers to: either the use of information as an element of national power, analogous to using economic warfare as bloodless coercion; or the use of information systems to exercise power by any entity, national or non national, through selective information system dominance and manipulation.<sup>87</sup> *Information age warfare* is warfare fought in the Third Wave environment--it

includes information warfare insofar as it is incorporated into the various contestants' overall strategies.<sup>88</sup>

Incorporating Second Wave blockades into information age warfare requires either a unilateral act of aggression; taking unilateral or multilateral action under the right of self defense; or persuading the U.N., by exercising informational and diplomatic elements of national power, to exercise its Article 42 option to impose blockades. For American military forces, the first choice is virtually excluded as a matter of policy, and for good reason. The United States benefits from world stability. The U.N. condemns aggression and pursues global stability through non-violent conflict resolution--objectives concurrent with American strategic aims.<sup>89</sup> Therefore, committing a unilateral act of aggression violates the logic of a rational America acting in its own interest. Undertaking multilateral action in response to a demonstrable security threat or hostile act is not aggression. It is legitimate under Article 51 when collective or unilateral security serves as justification--as in the Cuban Missile Crisis, and the Persian Gulf War. This logic can be applied to Third Wave blockades, though traditional blockade templates do not transpose precisely from one medium to the next.

### **Coining a Doctrinal Term**

A term which embodies the concepts germane to an information blockade is called for. It should incorporate the idea of a blockade as maritime interdiction acting in the various media of information the age--I offer the term *cyberblock*, a *cybernetic blockade*.<sup>90</sup> Cyberblocks, the interdiction of information in their own

media, are potential tools for promoting Information Age security.

### **Cyberblocks: Information Denial in Third Wave Warfare**

Schwartau describes two soldiers, or sailors, who need to be recruited and trained for information age war: mappers and crackers.<sup>91</sup> The mappers' function is to scout out the nodes and networks of a target information system, providing a diagram of the enemy disposition. The crackers infiltrate the networks and set cyberambushes which disable portions of the network when a trigger event occurs. For example, infiltrating an air defense system, the target handoff message from search to acquisition radars could be the trigger for a cyberambush, a virus that invades the logic circuits of related SAM batteries.<sup>92</sup>

Applied to an economic cyberblock, the nodes of fiber optic networks, cellular, satellite, and phone systems in the target are mapped prior to imposing sanctions. Crackers then begin infiltration to integrate the effects of the cyberblock with a maritime and air commerce interdiction of a target nation. The capacity to pay blockade runners for their efforts is cutoff when the funds don't transfer and the information that the target nation's credit is no good permeates through the World wide Web. Who will indulge in high risk ventures if no payment will come?

### **Measuring Cyberblock Effectiveness**

Operational and strategic planners of the information age need Third Wave flexible deterrent options. Applying the measures of effectiveness demanded of a blockade to information age assets, which are generally



characterized by electro-cybernetic hardware, should demonstrate the utility of a cyberblock.

Blockades have legal status under international law which helps define their character and political utility. Unlike the laws of the sea and land warfare, the laws of information warfare have yet to be established by practice and custom. This new measure of coercive interdiction may not retain the characteristics of a blockade. The air blockade illustrates this issue.

An air blockader has two options: a) shoot down inbound and outbound aircraft; or b) convince/coerce them to land at a neutral airfield or their airfield of origin. Unlike the right of visit and inspection embedded in seaborne blockades, in flight inspection of air cargo is physically impractical. Likewise, information in transit, particularly when encrypted, may not be accessible.<sup>93</sup> This limits the capacity to interdict contraband information and permit, neutral information to flow. A general cyberblock, for example the disabling of communications satellites, has the potential to interfere with neutral information needs. This could easily work at cross purposes with diplomatic and informational elements of power--much like unrestricted submarine warfare subverted Germany's geostrategic position in World War I.

Blockades work best when combined with other elements of power. Cyberblocks would logically operate under similar limitations. Using blockade measures of effectiveness as a guideline, the Persian Gulf War, a proto-information age conflict, can provide a benchmark for developing cyberblock employment criteria.

Modifying the measures of effectiveness described in Chapter Three to fit information warfare, the conditions required to conduct effective cyberblocks are:

- 1) Information Superiority/Supremacy.
- 2) Synergistic use of other elements of power.
- 4) Perseverance.
- 5) International support and sanction.

Applying a second wave cookie cutter to a third wave problem will not suffice. As Clausewitz warns, theoretical abstractions about war require modifications in practice.

### **Embargoing Iraq Revisited**

U.N. Security Council Resolution 661 imposed sanctions on Iraq that did not involving the use of armed force. Included was a clause directing that no state

"transfer any financial or economic resources, and shall prevent their nationals and any persons within their territories from removing from their territories or otherwise making available to that government [Iraq]. . . any such funds or resources. . . except for payments exclusively for strictly medical or humanitarian purposes, and in humanitarian circumstances, foodstuffs."<sup>94</sup>

As the intent was to coerce Iraq by non-violent means, it is worth noting that Article 41 contains a provision for embargoes in the information spectrum. It authorizes

" . . . complete or partial interruption of economic relations and of rail, sea, air, postal, *telegraphic, radio, and other means of communication*, and the severance of diplomatic relations."

This open ended fiat lays the legal foundation for a U.N. sponsored

information age embargo, wherein member nations coerce a miscreant into compliance. They isolate an aggressor by blocking any and all communications means: radio, telephone, satellite, land lines, even print media. They add traditional trade sanctions. The key to this effort would be the interdiction of financial transactions done via electronic means: part of the communication blockade. Ideally, the target state would be reduced to a receive-only mode beyond its own border. It would also prevent blockade runners and enterprising Third Wave smugglers from being paid via electronic media. The signature left by cash transactions would make tracking blockade breakers far easier than chasing them through cyberspace.

As mentioned in chapter three, the ability to maintain international consensus, particularly as economic entities exert pressure on, or bypass, national governments, are a limitation to keeping sanctions alive against a target nation. The current unregulated status of cyberspace, as embodied in the World Wide Web, means that no entity currently rules the cyberwaves as the Royal Navy ruled the sea during the latter part of the Age of Sail. The proliferation of national and anational power in cyberspace mirrors the chaotic use of sea power by many nations, and third party piracy, during the Age of Exploration.<sup>95</sup> At the moment, the law of the cyberseas is "might makes right"--as the law of the sea has traditionally been. Whether or not the moderating influence of international organizations can suppress the potential cyberpiracy remains to be seen. There are currently many third Wave tools available to lessen the pain inflicted by both Second Wave and Third Wave embargoes. Offshore banking and the discretion

of some European banks make identifying Third Wave blockade runners difficult. Decentralized smuggling operations leave small signatures, making them more difficult to counter.

An danger resident in clumsily handled cyberblocks would be the disruption of information assets in use by neutrals. For example, in the case of the cyberambush of an air defense system mentioned above, if the virus gets unintentionally transmitted across international borders into a neutral or friendly nation's phone system, the disruption would be the informational equivalent of collateral damage from air attack using conventional munitions. The political fallout could well compromise the entire mission, or lead to loss of international support necessary for successful interdiction.

If these factors render cyberblocks and embargoes unable to achieve political objectives through bloodless coercion, then overt measures may be undertaken to disrupt internal information systems. Some of the methods used in Desert Storm are very appealing. According to public sources, the American forces launched missiles which disrupted power grids and electronic networks using non-lethal means.

"On January 19, 1991, the U.S. Navy used Tomahawk cruise missiles to deliver "a new class of highly secret, non-nuclear electromagnetic pulse warhead" to disrupt and destroy Iraqi electronic systems."<sup>96</sup>

Other non-lethal means can be introduced by ships conducting a routine presence mission. For example, certain high power radars in the U.S. Navy's inventory can render civil microwave and cellular communications ineffective. In

the late 80's, some cellular phone nets in the San Diego and Los Angeles area suffered disruption at seemingly random intervals. The cause was traced to certain frequencies of high power radars used during fleet exercises.<sup>97</sup> A ship passing through the Panama Canal with its radar on created similar havoc.<sup>98</sup> But not all nations have littorals subject to naval influence. Nor is every coastal nation's infrastructure accessible from the littoral. (Examples are China, Russia, Iraq, Iran.) There is an asset which can reach these areas: the B-2.

If stealth aircraft remain "virtually invisible," it is not beyond the realm of possibility that a weapon reportedly launched by Tomahawk missiles could be modified for carriage by B-2 bombers, who might then invisibly penetrate a target area and deploy the non-lethal munitions. There are sensitive political issues involved, like the U-2 overflight issue after Gary Powers was shot down, which may mitigate against using this method. Yet even if those are resolved, and the synergistic effects of air, naval, diplomatic, and economic measures are employed to subdue rogue nations, there are entities without borders, and therefore without airspace, coastlines, or embassies, which may require targeting in the interest of global security.

### **Modifications in Practice**

Toffler and Schwartau point out that decentralization is one of the key attributes which separates Second Wave and Third Wave societies. This questions the validity of national identity, a construct which must exist in order for the concept of neutrality to apply. The paradigm of neutrality at sea was originally

determined by reference to a vessel's flag and national origin. Foreign registry of shipping, and such expedients as reflagging Kuwaiti tankers during the Iran/Iraq war, calls the relevancy of a ship's flag into question in nascent Third Wave blockades. More troubling is the issue of national organizations creating political blocks in cyberspace.<sup>99</sup> They can only be targeted by Third Wave means, since their physical locations are in dispersed neutral "territories," and they only exist in discrete nodes and times on the World Wide Web. Operating under the protection of neutral "flags" renders them relatively immune to military measures outside of targeting single nodes by underhanded conventional means.

During Desert Storm, information supremacy took the form of dominating the electromagnetic spectrum. Deprived of second wave cybernetic sensors and systems, the Iraqi Army was susceptible to surprise, multi dimensional attack, and coalition momentum shifts. This resulted in a Third Wave to Second Wave asymmetry-- similar to the 1940 Wehrmacht fighting Frederick's Prussians. (A Second Wave army against a First Wave army with proto-industrial equipment.)

Establishing information supremacy or superiority is as valid a concept as establishing air superiority or sea control. It acts like air and sea superiority by assuring freedom of action and denying it to the enemy. Information dominance is a means, not an end. Information increasingly flows through, the electromagnetic spectrum, a physical medium like water and air.

Information has no value in and of itself. It is to military, political or diplomatic operations what enzymes are to water in the human digestive system. The enzymes allow the water to digest food faster and more effectively-- they do

little or no digestion by themselves. Information allows military organizations to apply their coercive measures more effectively, but cannot necessarily carry out a coercive measure. It facilitates diplomatic and economic endeavors, particularly when it is more timely and accurate than information possessed by an opponent. A good example is insider information used for stock trades. Information's quality is measured relative to one's enemy and mission. One can infer that degrading and interdicting an adversary's information is as useful as improving one's own.

### **Implications and Conclusions**

Establishing information dominance is a prerequisite to waging successful Information Age warfare. It permits the owner the freedom of action necessary for bloodless, military, and bloodless military coercion to be effective. As multilateral operations become the rule, and unilateral operations the exception, information superiority, like sea control, will be need to be limited to the conflict in question. The consensus currently required of to conduct Second Wave embargoes and blockades will challenge to both military and political leaders, attempting to implement maritime interdiction and cyberblocks during the Information Age, to design operations which can be sustained over the time necessary to coerce the offending political entity into compliance with acceptable international behavioral norms.

Proliferation of information systems is likely to create more unintended outcomes, as current second wave coercive measures have done. Counters to Information Age blockades will emerge, and have to be neutralized in order for

embargoes and cyberblocks to retain their utility. Cyberblocks will, like their second wave ancestors, blockades, remain a strategic tool conducted by operational and tactical commanders. As such, they will be most effective when combined with all other elements of power.

### **Recommendations**

In order to enhance the utility of maritime and information interdiction, the intent of an operation should be discernable from its name. Joint doctrine requires more precision than is reflected in current manuals. The following term modifications are recommended:

1. Doctrinally define the term Maritime Interdiction as: "The denial sea lines of communication, in war or operations other than war, through commerce interdiction and the exercise of blockades, embargoes, and quarantines."

2. Doctrinally define embargo as: "Non-belligerent commerce interdiction characterized by use of maritime forces to intercept and inspect ships for contraband, and to divert, intern, or confiscate ships and contraband as rules of engagement permit."

3. Delete all reference to "passive blockade" from Joint publications. Embargo and quarantine are less ambiguous terms.

4. Incorporate the definition of "blockade" from NWP-9(Rev A) into Joint Pub 1-02.

5. Redefine Quarantine as: "Non-belligerent maritime interdiction specifically conducted to prevent the export and import of weapons of mass



destruction(WMD)." The logic of using this specialized term is tied to the unique nature of WMD's. Following the construct which evolved from Roosevelt's idea and Kennedy's action fits the contemporary international beliefs--WMD proliferators spread the disease of aggression.

6. Incorporate the term "Cyberblock" into Joint Pub 1-02 as: "Interdiction of information systems throughout electromagnetic and electro-optic spectra, and conventional transmission media."

The above recommendations are offered to help operational planners provide commanders with flexible deterrent options suitable to multilateral action in the Information Age.

## Endnotes

1. Herbert Rosinski, The Development of Naval Thought ed by B. Mitchell Stimpson, III Newport: Naval War College Press, 1977, p. 132. The essay from which this quote is taken, "The Role of Sea Power in Global Warfare of the Future," was originally published in *Brassey's Naval Annual*, 1947.

2. Ref Chapter VII, Article 42, United Nations Charter, 26 June 1945, San Francisco. The U.N. charter is in the public domain.

3. TRADOC PAM 525-5 Washington: Department of the Army, 1994. p. 2-4, categorizes non-nation state entities which may emerge as security threats as subnational, anational and, metanational:

Sub National threats include the political, racial, religious, cultural, ethnic conflicts that challenge the defining and authority of the nation state from within.

Anational threats operate without regard to the authority of their nation states. Not part of the nation state, these entities have no desire to establish such a status. Regional organized crime, piracy, and terrorist activities comprise these threats.

Metanational threats move beyond the nation state, operating on an interregional global scale. They include religious movements, international criminal organizations, and informal economic organizations that facilitate weapons proliferation.

4. I use the term "political entity" rather than nation, state, or nation-state in recognition of the increasing influence of anational, metanational and subnational groups on international affairs. Restricting the scope of coercive means to states and nation states is useful for illustration, but misses the leverage information age technology gives to those actors operating on the fringes of political legitimacy. Terms defined in U.S. Army TRADOC PAM 525-5 *supra* note 3.

5. My use of coercion is less restrictive than that of Robert A. Pape, "Coercion and Military Strategy: Why Denial Works and Punishment Doesn't" Journal of Strategic Studies, Vol 15, No 4. London: Frank Cass & Co, Ltd., Dec 1992. Pp. 423-475. He defines coercion as "changing the behavior of a state by manipulating costs and benefits in its decision calculus for a particular dispute." He differentiates this from deterrence, "discouraging an opponent from attempting to change the international status quo." James Cable, in Gunboat Diplomacy 1919-1991, Political Applications of Limited Force, 3d ed. (New York: St. Martin's Press, 1994), discusses coercion as the underlying premise behind use of naval forces to attain limited political objectives. I refer to a more generic definition of

coercion, drawn from the dictionary definition of the word, to wit, "coerce: to compel. . .to effect by force" , and "coercion: restraint; hindrance, especially by legal authority; compulsion; force." Webster's New Universal Unabridged Dictionary Second Edition New York: Simon and Schuster, 1983. P. 351, "coerce," entries 2 and 3.

6. The preamble to the U.N. Charter, which lays out the reason the U.N. was founded, includes the following language: "to save succeeding generations from the scourge of war...to practice tolerance and live together in peace with one another as good neighbors...to unite our strength to maintain international peace and security...that armed force shall not be used, save in the common interest.. Article II further requires that "All Members shall settle their international disputes by peaceful means in such a manner that international peace and security, and justice, are not endangered."

7. Alvin and Heidi Toffler War and Anti-War Boston: Little Brown & company, 1993. p. 13. The measurement of non-combatant deaths is somewhat arbitrary, since in many conflicts, the niceties of formal declarations of war and contests between professional/conscript armies are often absent. The ease with which people move from the roles weapons carrying participants to "civilian" in a matter of minutes, as in the case of the Viet Cong or clans in Mogadishu, Somalia, makes categorizing the "combatant" and "noncombatant" deaths nearly impossible.

8. Sun Tzu The Art of War Translated by Samuel B. Griffith New York: Oxford University Press, 1963. p. 77 .

9. Pape finds that, in general, preventing another nation from pursuing an unfavorable course of action is more successful as a coercive tool than punishing a state to undo a previous act. p. 445.

10. David Penn Cites 52 examples of "Carrier Presence" as response to a crisis since the Viet Nam War in "A Comparison of Long-Range Bombers and Naval Forces," Center for Naval Analysis 91-2242, working paper Alexandria, VA: November 1991, p. 9. Of these, 40 did not result in the use of force. James Cable cites 89 examples of "Gunboat Diplomacy" by the American Navy from 1919-1991.

11. (Naval Warfare Publication) NWP-9(Rev A) The Commander's Handbook on the Law of Naval Operations Washington: Office of the Chief of Naval Operations, 1989. P. 7-9.

12. Notable examples are the state of war which existed for decades between Israel and a plethora of Arab states and the Iran/Iraq war. The British did not

declare war on Argentina during the Falklands Campaign. The U.N. never "declared war" against Iraq, but it did authorize military measures by its Member States under article 42 of the UN Charter. The Persian Gulf War of 1991 passes the duck test--if it looks like a duck(war), quacks like a duck(war), and walks like a duck(war), it must be a duck(war).

13. Julian Corbett Some Principals of Maritime Strategy Annapolis: Naval Institute Press, 1988. p. 203: "By establishing a blockade we operate offensively against those [sea] communications." And p. 287-288: "The blockade is an economy of force to allow local control in the offensive theater of operations." Alfred Thayer Mahan ed. Allen Westcott Mahan on Naval Warfare Boston: Little Brown, 1943. p. 86 : "A militarily effective blockade of a base essential to the enemy will force his fleet to either fight or abandon the theater of war."

14. Toffler, p. 17.

15. JCS Publication 3-04, "Joint Maritime Operations(Air)" Washington: Chairman of the Joint Chiefs of Staff, 1991. p. 30.

16. Armed Forces Staff College Publication 1,(AFSC Pub-1) Norfolk: U.S. Armed Forces Staff College, 1993. List on p. 7-6. See also JOPES planning system, Joint Pub 5-03.1

17. Corbett, p. 163.

18. Corbett, p. 321.

19. Alfred Thayer Mahan "Blockades in Relation to Naval Strategy" United States Naval Institute Proceedings, Vol XXI, No. 4, pp. 864-865.

20. Cunningham, D.T. LCDR, USN, Naval Blockade: A Study of Factors Necessary for Effective Utilization Masters Thesis, U.S. Army Command and General Staff College, Fort Leavenworth, KS. 1987, p. 60. Citing O'Connell,D. P. "Influence of Law on Sea Power"Manchester: Manchester University Press, 1975. p.38.

21. Ibid. p. 60.

22. It has been argued that the Royal Navy was the only agency able to put the teeth into the anti-slavery laws passed in the first half of the nineteenth century. For example, the British blockade of Zanzibar in 1872 brought about a cessation of officially sanctioned slave trading in that East African Islamic Kingdom. Charles Miller Lunatic Express Nairobi: Westland Sundries, Ltd, 1987. P. 79-80.

23. The March 1995 flare up in a dispute between Canada and Spain over fishing rights off Newfoundland is a superb case in point. Regardless of the law

of the sea's provision for a 200 mile EEZ, economic Exclusion Zone, Spain's challenge to Canada's territorial waters was contested at gunpoint. The law of the sea is only as good as its enforcement. See Clyde H. Farnsworth, "Canada and Spain Collide Over Fishing Zone" New York Times 12 Mar 1995, sec: 1., p. 19. and "Canada Releases Seized Spanish Trawler" New York Times, 17 Mar 1995, Sec A. , P. 5.

24. Encyclopedia Britannica, "Fourteen Points" 15th ed Chicago: University of Chicago, 1986. Vol. 4, p. 907, col. 2b.. (This article reproduces Wilson's Fourteen points.)

25. O'Connel, p. 75. "By 1941 the rights of neutrals were abandoned."

26. NWP-9, p. 7-1.

27. NWP-9, p. 7-9.

28. NWP-9, p. 7-1

29. NWP-9, pp. 7-9 & 7-10. The doctrinal publication conforms with both the Code of International Armed Conflict and the Laws of War.

30. Ibid.

31. AFSC Pub-1, p. 7-6. "Pacific blockade" appears to have fallen from use due to ambiguities inherent in using "blockade" and "pacific" together, when blockade is defined as a belligerent action. This pub has the weakness of being virtual doctrine. It is used as an instructional text at the Armed Forces Staff College, as well as at Junior Service Schools. Yet it is not a doctrinal publication. Its widespread proliferation makes reference to it easy, becoming a source of our "common understanding of how we think about war--in short our doctrine." Since it references many Joint doctrinal publications, it can easily in place of coherent doctrine which may someday be published, since it is a comprehensive reference manual available to any Joint Staff Officer--not all of whom share the U.S. Army Training and Doctrine Command's fascination with doctrinal precision.

32. AFSC Pub-1, p. 1-13.

33. Of course, Kennedy was continuing the Cuban trade Embargo initiated by President Eisenhower, but that was a separate, long term policy designed to use economic warfare, bloodless coercion vice military bloodless coercion, to influence Cuban behavior.

34. McVickar, John Haight, Jr., "FDR and the Naval Quarantine of Japan" Pacific Historical Review Vol. 40, No. 2., 1971, p. 203.

35. "The League of Nations" Encyclopedia Britannica, 1985, *supra* 24, Vol. 1, p. 147, col. 1b. Article 39 of the U.N. charter similarly proscribes aggression.

36. Webster's New Universal Unabridged Dictionary, p. 1474, quarantine, *n*, and quarantine, *v.t.*, entries 4, and 1 and 2 respectively. Entries 1-3, and 5 of quarantine, *n*, refer to: 1. The medieval English law 40 day period of grieving a widow had before her departed husbands lands were seized; 2. The forty day rule on vessels infected with disease are/were detained in ports in strict isolation; 3. The location of said quarantined vessel; and 5. A place where persons, animals, or plants having contagious diseases are kept in isolation, or beyond which they are prohibited from travel. It seems President Roosevelt's intimate knowledge of infectious diseases, polio in particular, may have had an impact on the language he used to describe how he wished to isolate Japanese aggressors from the rest of Asia, and the rest of the world, in 1937.

37. *Ibid*.

38. Norman Friedman, a frequent contributor to Proceedings, misnames Adriatic Operation Maritime Guard as an "arms blockade" in his article "World Navies in Review" Proceedings Mar 1994. P. 98. Michael Pugh, "Multinational Naval Coordination" Proceedings April 1992, p. 73., refers to the U.N. sanctions against Iraq as the "coalition blockade." Under the rubric of article 42 of the U.N. charter, blockade is specifically delineated as a forceful measure usable by the U.N. to enforce its sanctions. However, he erred, since the language of U.N Security council resolutions, beginning with UNSC 661, authorized all necessary means to enforce the military and economic embargo against the Government of Iraq, with exception given to specific commodities usable only as humanitarian supplies. Yet President Bush never established a blockade. CDR Mistime A Annati, Italian Navy, takes pains to use the term "embargo" for Maritime Guard in his article "Stand By, We Are Boarding," Proceedings March 1994, p. 53-57. In "The Southern Region: NATO Forces in Action" NATO Sixteen Nations 2/93, pp. 5-9., ADM J.M Boorda, USN, cited the superb multinational operations in operation Maritime guard, which helped stem the flow of "embargoed goods" to what was Yugoslavia, in support of UN security Council Resolutions 713 and 757.

39. CDR Vincent J. Andrews, USN, Maritime Interception Operations Naval War College Newport RI June 1992.

40. Webster's Dictionary "embargo:" 1. A government order prohibiting the entry or departure of commercial ships at its ports, especially as a war measure. 2. Any restriction imposed on commerce by law; especially, a prohibition of trade in a particular commodity. Additional entries for amplification: *civil embargo* an embargo laid on ships of citizens by their own government *hostile embargo* an embargo laid on the ships of an enemy. p. 590.

41. AFSC Pub-1 addresses embargoes in its discussion of economic flexible deterrent options, not military flexible deterrent options.
42. This is based on the current outline under work at Naval Doctrine Command. A copy was provided me to assist my research for this paper.
43. James Cable, Gunboat Diplomacy, p. 3.
44. Joint Publication 1-02, "DoD Dictionary of Military and Associated Terms" Washington: Chairman, Joint Chiefs of Staff, March 1994, p. 355.
45. Joint Pub 3-0, "Doctrine for Joint Operations" Washington: Chairman of the Joint Chiefs of Staff, September 1993. p. III-9.
46. Air interdiction is defined in Joint Pub 1-02 as:  
"Air operations conducted to destroy, neutralize, or delay the enemy's military potential before it can be brought to bear effectively against friendly forces, at such distance from friendly forces that detailed integration of each air mission with the fire and movement of friendly forces is not required." [This has either a tactical or operational focus, depending on targets selected and the purpose behind their engagement.], p. 16. The Joint Interdiction publication, Joint Pub 3-03 has no discrete definition of maritime interdiction.
47. Joint Pub 1-02, p. 192.
48. Webster's Dictionary, "boycott" p. 217.
49. Resolution no. 16, the Council of the League of Arab States, Session 2, Schedule 11, 2 December 1945. Eliyau Zeev Gilat, CDR Israeli Navy, The Arab Boycott of Israel Masters Thesis, U.S. Naval Postgraduate School Monterey, CA 1992, p.6.
50. The conditions were expanded in "The Unified Boycott Law," Resolution No. 849, Article I, League of Arab States, 11 December 1954. According to Gilat, most provisions of the Boycott Law were incorporated into legislation in all of the countries comprising the Arab League. Gilat., p. 6
51. Gilat, p. 14.
52. Gilat, p. 14 (Coca-Cola) and p. 92. (Japan)
53. Gilat p. 57.
54. Gilat p. 87.

55. Hesh Kestin "Israel's Best-Kept Secret" Forbes Oct 22, 1984, p.50. Figure for arms sale, p. 62.
56. The Economist South Africa Country Profile London: The Economist Intelligence Unit, 1994, p. 5-6. In 1961, South Africa withdrew from the Commonwealth. The sanctions and political pressures intensified in the 1970's and 80's, eroding the economy and precluding South African participation in international sports, cultural exchanges, economic ventures, and political fora.
57. I assume that revisionist historians overstate their case when they charge that Roosevelt deliberately allowed a sneak attack on Pearl Harbor.
58. O'Connel, The Influence of Law on Sea Power, p. 64
59. O'Connel, p. 49. The British established this precedent in WW II against the Germans.
60. O'Connel. p. 94. Quoting The JAG Journal of the United States Navy, vol 22., 1967.
61. V.A. Patton Lessons Learned. Southeast Asia Mining Campaign Dahlgren: Naval Surface Weapons Center, Dahlgren Laboratory (DN-10), October 1975. p. 1.
62. Ibid., p. 1.
63. Ibid., pp. 1 & 15.
64. Stanley Karnow Vietnam: A History (revised edition) New York: Penguin Books 1991, p. 668. See also E. Doyle, S. Lipson, T. Maitland, The North (Time Life Books) Boston: Boston Publishing Co., 1986. p. 172-174. Doyle *et al* report U.S. accounting of SAMS, which put the figure of SAM's launched at 1242.
65. Idleson, Holly "Haitian Policy Sanctioned, Refugee Groups Object." Social Policy 26 Jun 1993: 1666 United States. Department of State Dispatch "OAS Resolutions: Resolution MRE/RES 3/92 on restoration of Democracy in Haiti (May 17, 1992)." Washington: 29 Jun 1992, Vol 3, No. 26, p. 525-526. United States. Department of State Dispatch "UN General Assembly Resolution 46/7 on Haiti." Washington: 14 Oct 1991, Vol 2, No. 41, p. 762.
66. Weekly Compilation of Presidential Documents. Administration of William J Clinton, 1993. Executive Order 12853- Blocking Government of Haiti Property and Prohibiting Transactions with Haiti. 30 Jun 1993. (p. 1206).
67. The Economist, 10 Oct 92, p. 54.



68. "Haiti: Punishing Victims." The Economist Feb 8 1992, p. 36.
69. Operation Evaluations Group Operation End Sweep Arlington: Center for Naval Analysis, Feb 1975. p. E.-10.
70. Elaine Sciolino "U.S. Tells of Iraq's Buildup." Kansas City Star, 12 April 1995, p. A-1. Originally printed in the New York Times.
71. "The Award Winning Staff of U.S News and World Report" Triumph Without Victory: The Unreported History of the Persian Gulf War New York: Random House, 1992, p. 417.
72. Ibid., p. 420.
73. Ibid. p. 429.
74. Ibid., Sciolino. See also Barbara Crossette, "Terms Set for Iraq to Sell Oil," Kansas City Star April 15 1995, p. A-1. Originally printed in New York Times.
75. "Iraq's Illicit Oil Sales Generate Millions" Kansas City Star April 11, 1995, p. A-6.
76. Ibid.
77. Ibid.
78. ADM J.M Boorda, USN, "The Southern Region- NATO Forces in Action" NATO Sixteen Nations No. 2/93, p. 8.
79. Ibid.
80. "Iran Sends 'tons of arms' to Bosnia" Kansas City Star 13 April 1995, p. A-3. Originally printed in Washington Post.
81. Ibid.
82. Cunningham, Naval Blockade: A Study of Factors Necessary for Effective Utilization.
83. Cunningham, pp.15-17, 42-43, 62-63.. A review of the three periods and two special blockades, the Union Blockade of the confederacy and the Cuban Quarantine of 1962, showed a consistent trend.
84. Ibid., p. 124.

85. Carl von Clausewitz, On War Ed. and Trans. by Michael Howard and Peter Paret Princeton: Princeton University press, 1976, p. 88.
86. Toffler, p. 23.
87. This second definition more closely fits into Winn Schwartau's vision of information warriors running rampant in cyberspace, using their knowledge of information systems to take advantage of less well informed victims on a variety of levels. these information warriors would make hackers seem almost welcome. See Winn Schwartau Information Warfare: Chaos on the Information Highway New York: Thunder's Mouth Press, 1994,.
88. The subject of information warfare has yet to acquire a precise doctrinal definition. Schwartau offers an alarming portrait of information systems wizards and hackers indulging in mass cyberterrorism. They exploit the industrial world's reliance on information based systems necessary to retain a competitive competitive edge. This view of information warfare transcends military concerns.
89. The White House A National Security Strategy of Engagement and Enlargement Washington: U.S. Government Printing Office, 1994. p. i.
90. This term is my own invention. The continual references to cyberspace by Internet surfers, and the theory of the cybernetic domain of battle proposed by military theorist Dr. James Schneider and historian Martin van Crevald, are contributing foundations to this synthesis.
91. Schwartau, p.300.
92. This sort of tactic was allegedly tried in the Persian Gulf War. Schwartau suggests a similar tactic, inserting "information moles into hard nodes" in Information Warfare, p. 86.
93. A good example of this was the U.S. Army's use of Southwest Native Americans as radio operators in two world wars. Their language was unwritten, and apparently a virtually unbreakable code to Japanese and Germans who listened in on American radio communications.
94. Triumph Without Victory, pp. 417-418.
95. I use this term to characterize the European colonization of much of the world from 1500 to 1800. The Imperial races in the 1800's were conducted within the context of a Royal Navy which ruled the seas virtually unchallenged -- a superpower analogy not unlike the position America finds itself in now.
96. Neil Munro, "Microwave Weapon Stuns Iraqis" Defense News April 15, 1992. Cited by Toffler, p. 149. and Schwartau, 181.

97. I learned of this while embarked on USS *Valley Forge*(CG-49) in late 1989. The problem had already been identified. We received routine reminders from higher echelon Navy commands to avoid certain frequencies at certain times during our exercise in order to prevent the problem from recurring. (And giving the Navy a public relations headache.)

98. Schwartau, p. 182.

99. Schwartau, p. 34.

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